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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,882	10/23/2003	Robert M. Japp	END920000150US2	8999
30449	7590	10/12/2004	EXAMINER	
SCHMEISER, OLSEN + WATTS			EGAN, BRIAN P	
SUITE 201			ART UNIT	
3 LEAR JET			PAPER NUMBER	
LATHAM, NY 12033			1772	

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/691,882

Applicant(s)

JAPP ET AL.

Examiner

Brian P. Egan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-13, 17 and 32-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-13, 17 and 32-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-5, 10, 17, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatch et al. (#4,929,370) in view of Weinreich (#5,435,671).

Hatch et al. teach a structure comprising a stack comprising a plurality of sheets such that each successive sheet is coupled with a removable adhesive between each sheet, and an opening extends through the plurality of sheets within the stack. The sheets may be selected from copper (Col. 4, lines 31-46). The removable adhesive is in the form of a lubricant which is a water soluble polymer (Col. 5, lines 30-45). The adhesive layer helps produce smooth-walled drill holes, i.e., burr free holes (Col. 5, lines 37-40). The adhesive layer adheres to substrates in solid form (Col. 3, lines 55-62) and transfers to the drill bit at higher temperatures – i.e., the removable adhesive melts at operating conditions to provide lubrication for the drill bit (Col. 5, line 25 to Col. 6, line 35). The removable adhesive has a melting temperature of 60-65°F. Thus, it is implicit that the entire structure operates at temperature conditions within this range or above to facilitate melting of the adhesive and subsequent lubrication of the drill bit.

Hatch et al. further teach the use of entry and exit materials positioned on opposing sides of the stack of sheets (Fig. 3, #s 34 and 36). The entry and exit material for the sheets is typically some type of paper base or thin metal sheet such as aluminum (Col. 6, lines 54-56).

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Although Hatch et al. teach the use of an entry and exit material layer, Hatch et al. fail to teach the use of a burr preventing layer/ foil layer combination as claimed by the Applicant.

Weinreich, however, teach the use of a multilayered entry/exit board comprising a paper board laminate impregnated with a lubricant and aluminum foil layer combination (see Fig. 1). The multilayered entry/exit board is taught by Weinreich for the purpose of resisting burr-formation during drilling (Col. 2, lines 21-46). It would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have combined the teachings of Hatch et al. and Weinreich since each of the aforementioned references are analogous insofar as being directed at entry/exit substrates for improving the drilling of stacked metal substrates.

Therefore, it would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have modified Hatch et al. to include a multilayered entry/exit board as taught by Weinreich in order to resist burr-formation during drilling.

With regards to the claim 17 limitation that there exists a plurality of stacks with intermediate burr-preventing layers, although Hatch et al. and Weinreich both fail to explicitly teach a multi-stack formation, modifying the aforementioned art to include a plurality of stacks would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 70. Here, the essential working parts of the invention are taught by Hatch et al. and Weinreich and one of ordinary skill in the art need only duplicate the base stack formation to be in accordance with the Applicant's claimed invention. Furthermore, the outermost aluminum layer in a stack as taught

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by Hatch et al. can serve as an intermediate layer as claimed by the applicant when in multiple stack formation.

3. Claims 6-9, 12-13, and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatch et al. ('370) in view of Weinreich ('671), and further in view of Frater (#6,355,360).

Hatch et al. and Weinreich teach a structure as detailed above. The aforementioned prior art is silent with regards to the use of a three stainless steel plates on each side of the stack of metal substrates as well as a blotter pad within the three stainless steel plates. It is notoriously well known in the art, however, to provide at least three stainless plates in combination with a foil layer in the production of printed circuit boards as evidenced by Frater (Col. 2, lines 53-64). These steel plates implicitly comprise pressure heads wherein a compressive force acts upon the entire substrate. Frater teaches that it is generally well known in the art to use multiple steel plates to prevent and minimize scrap and rework due to image transfer and surface quality problems (Col. 2, lines 53-54). It would have been obvious to one of ordinary skill in the art at the time Applicants invention was made to have combined the teachings of Hatch et al., Weinreich, and Frater, since each of the aforementioned references are analogous insofar as being directed to improving the drilling operation in stacked metal formations.

Therefore, it would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have modified Hatch et al. and Weinreich to include a three layered stainless steel configuration on each side of the foil layer lying adjacent the top and bottom of the stack of sheets as taught by Frater in order to prevent and minimize scrap and rework due to image transfer and surface quality problems. It further would have been obvious to one of ordinary skill in the art to provide a paper (blotter) substrate between one of the steel

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plates since it is notoriously well known in the art to provide paper substrates in order to facilitate even application of pressure between opposing plates.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatch et al. ('370) in view of Weinreich ('671), and further in view of Block (#4,269,549).

Hatch et al. and Weinreich teach a structure as detailed above. Each of the aforementioned references detail the use of an aluminum foil layer but fail to teach the use of a copper foil layer other than Hatch et al.'s disclosure of stacked copper substrates. It is notoriously well known in the art, however, that although aluminum is generally a preferred foil material, functionally equivalent foil materials including copper, magnesium, and steel may also be used as the foil sheets in entry/exit board formations as evidenced by Block (Col. 2, lines 5-11). Therefore, absent demonstration of unexpected results, it would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to have substituted the aluminum foil layer in both Hatch et al. and Weinreich with a functionally equivalent copper layer as taught by Block depending on the desired end product.

Response to Arguments

5. Applicant's arguments filed July 21, 2004 have been fully considered but they are not persuasive.

The applicant sets forth three primary issues of contention.

First, the applicant contends that the lubricating layer in Hatch et al. is not an adhesive. The examiner respectfully disagrees. The examiner must interpret the claims as broadly as is reasonably possible. Here, Hatch et al. teach a wax-based material (Col. 5, lines 40-48), which

in itself is implicitly adhesive, that exhibits adhesive characteristics since it is adherable to substrates in dry, hardened form (Col. 3, lines 55-62).

Second, the applicant contends that the entry board of Weinreich is not a foil but instead is a non-metallic sheet. The examiner respectfully disagrees. The applicant has not provided closed language such as "consisting of" in defining the claimed limitations. Therefore, the entry board need not be made only of foil but may be in combination with another material. Here, Weinreich explicitly teaches a multilayered entry board material, at least one layer being formed of a foil material (Col. 1, lines 45-68). Weinreich further teaches specific embodiments wherein the foil layer is aluminum (Col. 3, lines 15-42). Therefore, the examiner maintains that Weinreich fairly suggests the use of a foil layer as claimed by the applicant. With regards to further motivation in replacing the burr formation board of Hatch et al. with the board detailed by Weinreich, Weinreich's board provides a comparative advantage insofar as being reusable (Col. 3, lines 1-12) and improves upon the operational characteristics of the substrate (Col. 1, lines 45-52).

Finally, the applicant contends that the examiner has not established a functional equivalence between copper and aluminum for the purposes taught by Weinreich. The examiner respectfully disagrees. First, both Block and Weinreich are directed at backing boards. Block explicitly states that "the backup board comprises a pair of opposing metallic foil sheets which may be copper, magnesium, or steel but are preferably of aluminum..." (Col. 2, lines 5-7). Therefore, both copper and aluminum are sufficient in providing a backing board with the desired characteristics for drilling operations. Thus, the examiner maintains the assertions with regards to the functional equivalence between the materials made in the prior office action.

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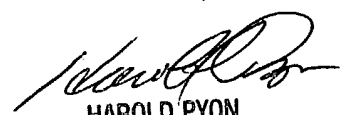
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Egan whose telephone number is 571-272-1491. The examiner can normally be reached on M-F, 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


BPE


HAROLD PYON
SUPERVISORY PATENT EXAMINER

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10/27/04